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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,416	12/21/2001	Eric M. Kimber	BTW-033	5665
959	7590	10/08/2003	EXAMINER WONG, ERIC K	
LAHIVE & COCKFIELD 28 STATE STREET BOSTON, MA 02109			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n No.

10/032,416

Applicant(s)

KIMBER ET AL.

Examiner

Eric Wong

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14. 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities: The claimed insulating planarization layer is level with the top of the waveguide STACK. Applicant makes no mention of the waveguide stack in the claims. Appropriate correction is required.
2. Claim 9 is objected to because of the following informalities: Applicant makes no mention of a semiconductor support structure in the specification. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant makes no mention of a common ground electrode layer beneath a waveguide section in the specification or drawings.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an

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international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 6-8, 13, 17-19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent Number 6,545,791 to McCaughan et al.

As to claims 1 and 13, McCaughan discloses in figure 4, an integrated circuit comprising;

- A semiconductor substrate (29);
- An optical waveguide formed over the substrate (14,15);
- An insulating planarization layer formed adjacent the optical waveguide and level with the top of the waveguide (23, 24, 25 and column 15, lines 27-36); and
- A microwave transmission line formed over the planarization layer and overlying a top surface of the optical waveguide (19,20).

6. As to claims 6 and 17, two waveguide sections are formed over the substrate and wherein a respective transmission line for each waveguide section is formed over the planarization layer (Figure 4).

7. As to claims 7 and 18, the spacing inbetween the waveguide is filled with a planarization layer (23, 24, 25 and column 15, lines 27-36).

8. As to claims 8 and 19, an air gap may be provided between the waveguide sections (23, 24, 25 and column 15, lines 27-36).

9. As to claim 20, the patterning of layers defines bridge portions adjacent to the waveguide stacks (Figure 4).

***Claim Rejections - 35 USC § 103***

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10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 9, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCaughan as applied to claims 1 and 13 above, and further in view of applicant's disclosure of prior art.

McCaughan discloses the use of an electrical insulation layer made of polyimide (column 9, lines 24-36), but fails to explicitly disclose the use of tetra-ethylortho-silicate (TEOS) as an insulating material and its use in a compound waveguide stack.

Applicant discloses in paragraph 18, that TEOS is widely used in the industry as a planarization, material and interconnect dielectric (Paragraph 40-41).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the TEOS material as described by applicant in order to reduce microwave losses.

12. Claims 3-5, 12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCaughan as applied to claims 1 and 13 above, and further in view of applicant's disclosure of prior art.

McCaughan discloses a circuit with microwave transmission lines and waveguide on a substrate, but fails to explicitly disclose a compound semiconductor substrate.

Applicant discloses in paragraph 9, conventional means in which integrated circuits use compound semiconductors for incorporating waveguide structures.

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It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use a conventionally known process of using compound semiconductors such as Gallium Arsenide to insulate waveguides from microwave transmission lines.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Wong whose telephone number is 703-305-4741. The examiner can normally be reached on Monday through Friday, 830AM - 430PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 703-308-4819. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

EW



HEMANG SANGHAVI  
PRIMARY EXAMINER